CLAIMS

1. An isolated polypeptide presenting at least one activity of human IFNgamma, and comprising a sequence having:

   a) at least 80% of homology with the complete sequence of pIFNFHcon (SEQ ID NO: 156); and

   b) no more than nine non-conservative mutations in the positions corresponding to Ala10, Gly12, Arg26, Ala31, Lys35, Phe47, Gln55, Glu57, Lys63, and Ile75 in pIFNFHcon.

2. The polypeptide of claim 1 that comprises a sequence having at least 80% of homology with the complete sequence of pIFNFHcon and no non-conservative mutations in the positions corresponding to Ala10, Gly12, Arg26, Ala31, Lys35, Phe47, Gln55, Glu57, Lys63, and Ile75 in pIFNFHcon.

3. The polypeptide of claim 2 that comprises a sequence chosen from pIFNFH15 (SEQ ID NO: 20), pIFNFH32 (SEQ ID NO: 32), and pIFNFH37 (SEQ ID NO: 36).

4. The polypeptide of claim 1 that comprises a sequence having at least 80% of homology with the complete sequence of pIFNFHcon and one or two non-conservative mutations in the positions corresponding to Ala10, Gly12, Arg26, Ala31, Lys35, Phe47, Gln55, Glu57, Lys63, and Ile75 in pIFNFHcon.

5. The polypeptide of claim 4 that comprises a sequence chosen from pIFNFH04 (SEQ ID NO: 6), pIFNFH03 (SEQ ID NO: 4), pIFNFH08 (SEQ ID NO: 8),

pIFNFH20 (SEQ ID NO: 22), pIFNFH23 (SEQ ID NO: 24), pIFNFH12 (SEQ ID NO: 14), pIFNFH25 (SEQ ID NO: 26), pIFNFH13 (SEQ ID NO: 16), pIFNFH14 (SEQ ID NO: 18), pIFNFH36 (SEQ ID NO: 34), and pIFNFH39 (SEQ ID NO: 38).

6. The polypeptide of claim 1 that comprises a sequence having at least 80% of homology with the complete sequence of pIFNFHcon and three, four, or five non-conservative mutations in the positions corresponding to Ala10, Gly12, Arg26, Ala31, Lys35, Phe47, Gln55, Glu57, Lys63, and Ile75 in pIFNFHcon.

7. The polypeptide of claim 6 that comprises a sequence chosen from pIFNFH11 (SEQ ID NO: 12), pIFNFH27 (SEQ ID NO: 28), pIFNFH01 (SEQ ID NO: 2), pIFNFH31 (SEQ ID NO: 30), pIFNFH10 (SEQ ID NO: 10), and pIFNFH42 (SEQ ID NO: 40).

8. The polypeptide of claim 2, 4, or 6 that is a variant, a mature form, or an active fragment of the amino acid sequences SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, and 40.

9. The polypeptide of claim 8 that is a naturally occurring allelic variant of the sequences SEQ ID NO: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, and 40.

10. The polypeptide of claim 9, wherein the variant is the translation of one or more single nucleotide polymorphisms.

11. A fusion protein comprising a polypeptide according to any of the claims from 1 to 10 and a sequence heterologous to pIFNFHcon.

12. A fusion protein of claim 11 wherein said protein further comprise one or more amino acid sequence belonging to these protein sequences: membrane-bound protein, immunoglobulin constant region, multimerization domains, extracellular proteins, signal peptide-containing proteins, export signal-containing proteins.

13. A ligand binding specifically to a polypeptide according to any of the claims from 1 to 10.

14. The ligand of claim 13 that antagonizes or inhibits the IFNgamma -related activity of one or more polypeptides according to any one of claims 1 to 10.

15. A ligand according to claim 14 that is a monoclonal antibody, a polyclonal antibody, a humanized antibody, or an antigen binding fragment.

16. A ligand according to claim 14 that corresponds to the extracellular domain of a membrane-bound protein.

17. The polypeptides of any of the claims from 1 to 16, wherein said polypeptides are in the form of active fractions, precursors, salts, or derivatives

18. The polypeptides of any of the claims from 1 to 16, wherein said polypeptides are in the form of active conjugates or complexes with a molecule chosen amongst radioactive labels, fluorescent labels, biotin, or cytotoxic agents.

19. A peptide mimetic designed on the sequence and/or the structure of a polypeptide of claim 1.

20. An isolated nucleic acid encoding for an isolated polypeptide selected from the group consisting of:

a) the polypeptides of any of the claims from 1 to 10;

b) the fusion proteins of claim 11 or 12; or

c) the ligands of any of the claims 13 to 16.

21. The nucleic acid of claim 20, comprising the coding portion of a DNA sequence selected from the group consisting of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, and 39, or the complement of said DNA sequence.

22. A purified nucleic acid which hybridizes under high stringency conditions with a nucleic acid selected from the group consisting of SEQ ID NO: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, and 39 , or a complement of said nucleic acid.

23. A vector comprising a nucleic acid of any of claims from 20 to 22.

24. The vector of claim 23, wherein said nucleic acid molecule is operatively linked to expression control sequences allowing expression in prokaryotic or eukaryotic host cells of the encoded polypeptide.

25. A process for producing cells capable of expressing a polypeptide of any the claims from 1 to 16, comprising genetically engineering cells with a vector or a nucleic acid according to any of the claims from 20 to 24.

26. A host cell transformed with a vector or a nucleic acid according to any of the claims from 20 to 24.

27. A transgenic animal cell that has been transformed with a vector or a nucleic acid according to any of the claims from 20 to 24, having enhanced or reduced expression levels of a polypeptide according to any one of claims from 1 to 10.

28. A transgenic non-human organism that has been transformed to have enhanced or reduced expression levels of a polypeptide according to any one of claims from 1 to 10.

29. A method for making a polypeptide of any the claims from 1 to 10 comprising culturing a cell of claim 26 or 27 under conditions in which the nucleic acid or vector is expressed, and recovering the polypeptide encoded by said nucleic acid or vector from cell culture.

30. A compound that enhances the expression level of a polypeptide according to any one of claims from 1 to 10 into a cell or in an animal.

31. A compound that reduces the expression level of a polypeptide according to any one of claims from 1 to 10 into a cell or in an animal.

32. The compound of claim 30 that is an antisense oligonucleotide or a small interfering RNA.

33. Purified preparations containing a polypeptide of any of the claims from 1 to 18, a peptide mimetic of claim 19, a nucleic acid of any of the claims from 20 to 24, a cell of claim 26 or 27, or a compound of any of the claims from 30 to 32.

34. Use of a polypeptide of any of the claims from 1 to 12, a peptide mimetic of claim 19, or a compound of claim 30, in the therapy or in the prevention of a disease when the increase of a human IFNgamma-related activity of a polypeptide of any of the claims from 1 to 10 is needed.

35. Pharmaceutical compositions for the treatment or prevention of diseases needing the modulation of a human IFNgamma-related activity of polypeptide of any of the claims from 1 to 12, a peptide mimetic of claim 19, or a compound of claim 30, as active ingredient.

36. Process for the preparation of pharmaceutical compositions, which comprises combining polypeptide of any of the claims from 1 to 12, a peptide mimetic of

claim 19, a nucleic acid of any of the claims from 19 to 23, a cell of claim 25 or 26, or a compound of any of the claims 29 to 31, together with a pharmaceutically acceptable carrier.

37. Method for the treatment or prevention of diseases needing the increase of a human IFNgamma-related activity of a polypeptide of any of the claims from 1 to 10, comprising the administration of a therapeutically effective amount of polypeptide of any of the claims from 1 to 12, a peptide mimetic of claim 19, or a compound of any of the claims 30.

38. Use of a ligand of any of the claims from 14 to 16, or of a compound of claim 31 or 32, in the therapy or in the prevention of a disease associated to the excessive human IFNgamma-related activity of a polypeptide of any of the claims from 1 to 10.

39. Pharmaceutical compositions for the treatment or prevention of a disease associated to the excessive human IFNgamma-related activity of a polypeptide of any of the claims from 1 to 10, containing a ligand of any of the claims from 14 to 16, or of a compound of claim 31 or 32, as active ingredient.

40. Process for the preparation of pharmaceutical compositions for the treatment or prevention of diseases associated to the excessive human IFNgamma-related activity of a polypeptide of any of the claims from 1 to 10, which comprises combining a ligand of any of the claims from 14 to 16, or of a compound of claim 31 or 32, together with a pharmaceutically acceptable carrier.

41. A method for the treatment or prevention of diseases related to the polypeptide of any of the claims from 1 to 10, comprising the administration of a therapeutically effective amount of a ligand of any of the claims from 14 to 16, or of a compound of claim 31 or 32.

42. A method for screening candidate compounds effective to treat a disease related to the polypeptides of any of the claims from 1 to 10, comprising:

a) contacting a cell of claim 26 or 27, or a transgenic non-human organism according to claim 28, having enhanced or reduced expression levels of the polypeptide, with a candidate compound; and

b) determining the effect of the compound on the animal or on the cell.

43. A method for identifying a candidate compound as an antagonist/inhibitor or agonist/activator of a polypeptide of any of the claims 1 to 10 comprising:

(a) contacting said polypeptide and said compound with a mammalian cell or a mammallian cell membrane capable of binding the polypeptide; and

(b) measuring whether the compound blocks or enhances the interaction of the polypeptide, or the response that results from such interaction, with the mammalian cell or the mammalian cell membrane.

44. A method for determining the activity and/or the presence of the polypeptide of any the claims from 1 to 10 in a sample, the method comprising:

(a) providing a protein-containing sample;

(b) contacting said sample with a ligand of any of the claims from 13 to 16; and

(c) determining the presence of said ligand bound to said polypeptide.

45. A method for determining the presence or the amount of a transcript or of a nucleic acid encoding the polypeptide of any the claims from 1 to 10 in a sample, the method comprising:

(a) providing a nucleic acids-containing sample;

(b) contacting said sample with a nucleic acid of any of the claims 20 to 24; and

(c) determining the hybridization of said nucleic acid with a nucleic acid into the sample.

46. Use of a primer sequence containing any of the sequences SEQ ID NO: 41 -78 for determining the presence or the amount of a transcript or of a nucleic acid encoding a polypeptide of any the claims from 1 to 10 in a sample by Polymerase Chain Reaction, nucleic acid sequencing, or nucleic acid hybridization.

47. A kit for measuring the activity and/or the presence of the polypeptides of any of the claims from 1 to 10 in a sample comprising one or more of the following reagents: a polypeptide of any of the claims from 1 to 16, an active conjugate or complex of claim 18, a nucleic acid of any of the claims from 20 to 24, a cell of claim 26 or 27, a compound of any of the claims from 30 to 32, or a primer sequence containing any of the sequences SEQ ID NO: 41 -78.

48. Use of a sequence of claim 3, 5, or 7 as signal sequence.

49 The use of claim 49 wherein the sequence is chosen from pIFNFH27 (SEQ ID NO: 28), pIFNFH39 (SEQ ID NO: 38), and pIFNFH42 (SEQ ID NO: 40), or any secreted fragment of them.